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Characteristics and Inspiration About Critical Thinking Teaching in North America

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Abstract

This paper discussed characteristics of critical thinking teaching in North America from six aspects, respectively debate, definitions and assumptions, component, content and method, pattern and roll booster of critical thinking education, also its inspiration to China's critical thinking education through four aspects.

Key words: Critical thinking; Skill; Temperament; Teaching

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INTRODUCTION

Since Robert E. Young published *Fostering Critical Thinking* in 1980 and James E. Stice published *Developing Critical Thinking and Problem-Solving Abilities* in 1988, American scholars gradually regarded development of students' critical thinking skills and temperament as the new direction of class teaching. Nowadays, critical thinking skills and temperament are already become common goals among European and American developed countries' education and achieved initial success; but they all know it's still long way to go to achieve this goal indeed. In contrast with this, there are few universities of China's over 2000 colleges and universities opening critical thinking courses and Chinese scholars are still in the exploratory stage of critical thinking research. In spite of this, we should also see that more and more scholars are focusing on it and trying to develop students' critical thinking skills and temperament (Wu, 2003; Zheng & Wang, 2012; Zheng & Li, 2010; Zhu, 2012; Dong & Liu, 2013).

1. CHARACTERISTICS ON CRITICAL THINKING TEACHING IN NORTH AMERICA

Comparison is an important means and method to realize distance and insufficiency. In hence, realizing characteristics on critical thinking teaching in North America has great reference significance to promote development of China's. Critical thinking teaching in North America has following six characteristics.

1.1 Concept Collision: Whether It Should Develop Critical Thinking

In quite a long period, the government of North America didn't support cultivation of critical thinking in higher education, let alone critical thinking teaching. there're two different views in academic community: Most of them think students should accept the education about how to think and they believe that government is misled at this question; some scholars are skeptical on this view, for example, Glaser cited an abundant evidence of critical thinking failures in support of his argument that thinking skills are context - bound and do not transfer across indicates academic domains) (Glaser, 1984). Part views of Glaser and some skeptics' are correct, because better thinking is not inevitable outcome based on traditional

single subject teaching. However, if critical thinking skills develop students' ability of knowledge transfer from multiple subjects and examples, they can learn how to think and improve ability in cross academic field. In *Developing Critical Thinking and Problem-Solving Abilities,* Rubinstein's highly successful course in problem solving (Rubinstein & Firstenberg, 1987), Lochhead and Whimby's analytical reasoning procedures (Lochhead & Whimby, 1987), as well as Woods's use of deliberate planning and monitoring (Woods, 1987) provided successful examples for critical thinking education, they finally swayed criticism from the most severe skeptics. Under such kind of concepts collision, developing students' critical thinking skills is gradually accepted by most academic community as well as government and society.

In 2000, when American national education goals committee confirmed the following goal: "The proportion of college graduates who demonstrate an advanced ability to think critically, communicate effectively, and solve problems will increase substantially" (National Education Goals Panel, 1991), critical thinking education has become core agenda in national education. Although Bush and Clinton administration didn't provide funds to achieve this goal but dedicated professors and community leader were emphasizing its importance in higher education. Nowadays, critical thinking teaching has become important component of European and American general education need, lots of colleges provide specially designed courses to improve students' critical thinking ability and temperament. After thirty years' efforts, this concept has rooted in Europe and the United States education and is developing very well.

1.2 Definitions and Assumptions: What Is Critical Thinking?

Since Young put forward "what is critical thinking" in *Developing Critical Thinking*, the definitions about it cannot be counted. Some scholars think that critical thinking's using cognitive skills or strategies to increase probability of ideal outcome; while others think critical thinking's purposeful, rational and goal-oriented. It's kind of thinking could solve problems, formulate inferences, calculate possibilities and make decisions; some others hold the opinion that critical thinker shall use these skills properly under the environment without hint and with purpose, that's to say, they tend to be critical thinking; Halpern thinks, when we think critically, we are evaluating the outcomes of our thought processes—how good a decision is or how well a problem is solved (Halpern, 1996; Halpern, 1998), such definition is widely enough to cover all kinds of opinions. In hence, critical thinking could be used in teaching of argument analysis (Kahane, 1997), problem solving (Mayer, 1992), decision making (Dawes, 1998) or cognitive process (Rabinowitz, 1993).

Neglecting teachers' academic background or languages used for describe critical thinking, all the definitions including the same basic principles, that's they share the common assumptions: There's critical thinking skills could be both learned and taught, and when students learned that and can apply properly, they can be better thinkers. Through assumptions, we can see critical thinking skills exist and are discrepant also can be trained and tested. They're quite important, because they're preconditions to develop critical thinking education especially in class.

1.3 Temperament: Integral Part of Critical Thinking

Critical thinking includes two aspects: one is the critical thinking ability, that is to say, use right skills successfully in the proper cases; the second is critical thinking dispositions, that is to say, the attitude or temperament of identifying if certain skill is necessary, and actively apply it. Their relationship is like two feet of people, two wings of the bird, which is complementary and indispensable. Therefore, in addition to teach students critical thinking ability, also have to develop students' critical thinking dispositions; if students do not tend to use critical thinking skills, it is not enough to teach students critical thinking skills only.

Critical thinking dispositions include truth-seeking, open-mindedness, analyticity, systematicity, self-confidence, inquisitiveness, and maturity. Sears and Parsons call these dispositions the ethic of a critical thinker (Sears & Parsons, 1991). Wagner thinks that lazy or sloppy thinkers may have a large repertoire of critical thinking skills but not be inclined to use any of them. No one can develop expertise in an area without engaging in effortful processes of thinking (Wagner, 1997). Critical thinking dispositions exist, discrepant, which can be trained, tested, as well as critical thinking skills. For example, the California critical thinking disposition test is a carefully designed measurement tool which is used to test critical thinking emotion and attitude. Therefore, teachers need to find ways to make students attach great importance to good thinking and the work which can help to cultivate their critical thinking dispositions.

1.4 Exciting Changes: Contents and Methods of Critical Thinking Teaching

In North America, emphasis on critical thinking teaching fundamentally changed problems of what some university teachers teach and how to teach. For example, there are several national efforts to teach statistics as a broadly applicable critical thinking skill, instead of teaching it as technique for data analysis (Smith, 1995). Teachers who want to try new teaching methods can use many new curriculums with high quality of teaching and learning materials on the Internet. The course called Probability is a striking example. It teachs statistics principles by

using various problems and materials in the real world. This course is on a very active website, which is provided by teachers from many universities. These universities include Spelman, Grinnell, Dartmouth, Middlebury, and Vermont. The course covers subject areas in real life, including polls and surveys, lotteries, AIDS, DNA fingerprinting, and smoking, etc..

If teachers want to change the key point of any course and make it pay more attention to cultivate thinking ability basis, they can find on the Internet for help. For example, about the psychology course at university level - Psychplace, there is such a common website (www.psychplace.com). Its learning activities are designed to help students to think critically about problems in this subject. Specifically it embodies in applying critical thinking skills on the course contents in the case with clear teaching skills and contents. Other teaching materials include sample syllabi, reading lists, demonstrations, and learning activities are gathered together. These resources are free and available. Thus it can be seen that different subjects or courses have integrated critical thinking into the teaching of this subject or this course in the general education in Europe and the United States, and involved subjects are derived from real life. It no longer takes critical thinking as a separate course for teaching.

Affected by the impact of information technology revolution, the 21st century education will transform into how to use knowledge purposefully from pure knowledge, which makes learning more valuable and flexible. Not only does it provide more and better ways of teaching for teachers, but also it increases the demand of the critical thinking skills. The ability of classification and information evaluation is more important than ever before because overwhelming information is available by just using a few keys. It is important to note that most information available on the Internet is not reliable, even dangerous and deceptive. Therefore, the ability to identify the credibility of information sources has become a kind of indispensable critical thinking skill, which needs to be taught purposefully again and again in college or even earlier. In general, the information technology revolution not only provides more and better ways of teaching for critical thinking, but also highlights the important value and function of critical thinking skills for the present and the future.

1.5 Model Made Up of Four Parts: How to Do Critical Thinking Teaching

In 1998, Halpern proposed a critical thinking teaching model that is made up of four parts. It not only includes critical thinking skills and dispositions, but also includes structure training and meta-cognitive monitoring.

"*Structure training* as a means of improving the probability that students will recognize when a particular thinking skill is needed, even in a novel context. The problem in learning thinking skills that are needed in multiple contexts is that there are no obvious cues in the novel contexts that can trigger the recall of the thinking skill." (Halpern, 1999) In structure training, teaching students create retrieval clues in problems or argument structure characteristics, when these structural characteristics appeared in the new context, they can be used as a clue to be retrieved. When these structure characteristics appear in the new context, they can be used as a clue to be retrieved. Hummel and Holyoak thinks that structural sensitivity as a basic attribute consists of human thinking basis: "First thinking is structure sensitive. Reasoning, problem solving, and learning…depend on a capacity to code and manipulate relational knowledge." (Hummel & Holyoak, 1997). For example, in the face of the question in the test—why contact is not causality, students have the ability to explain; however, when they read that the test score of children from church school is higher than children from public schools in standardized test, they do not realize that both have the same principle. Therefore, teaching students identify structural characteristics of related problems will help them improve the probability of identifying these problems, even in different topics.

Metacognitive monitoring is the last component of critical thinking teaching. Metacognition is generally defined as "what we know about what we know", thus, metacognitive monitoring is the process that determines how to apply this knowledge to guide and improve study and thinking. Students are required to monitor their thinking process during critical thinking, check the progress towards a proper goal to ensure the accuracy and make decisions on time and brain use. Among terms of cognitive psychology field, metacognitive monitoring serves the executive function that guides thinking process. It's open and conscious during the teaching process, and simulating the thinking process of teachers through them. Therefore, generally thinking activity of an individual teacher is visible and outward for inspection.

Anyway, the critical thinking teaching model put up by Halpern consists of four parts: critical thinking skills and temperament, structure training and metacognitive monitoring. Among them, the goal is to cultivate and elevate critical thinking skills and temperament of students and the structure training is the method and means. Metacognitive monitoring is the organizational guarantee that ensures using the structure training method to cultivate and elevate critical thinking skills and temperament of students. These four parts constitute an organic integrity so as to facilitate critical thinking teaching.

1.6 Modern Cognitive Psychology: The Roll Booster of Critical Thinking Teaching

Modern cognitive psychology mainly studies the knowledge acquisition, restoration, extraction and application process of people, and believes humans

are active other than passive when the information is processed, also it emphasizes the importance of knowledge. The research results break a new ground for modern teaching and provide new approaches. As a result, it exerts an incredibly impact on modern teaching, especially has significant inspiration for the conversion of teachers' roles and functions." (Hai, 2007)

In 1987, Rosnick's modern psychological research on learning process indicated that, two significant rules existed in psychological critical thinking teaching (Donald, 2010): One was that critical thinking would not be learned through the metaphysical approach, but could be learned in specific learning materials of different disciplines; another was that, the skills of critical thinking required by different disciplines were not the same, because every discipline had its own unique thinking and reasoning method. For example, reasoning and solutions in physics were being influenced by the specific combination of conclusion and deductive reasoning, mathematical verification and public recognized facts. Besides, new theories shall be put up to explain these recognized facts; but in the social sciences field, rigorous reasoning and solutions were prone to be more influenced by traditional rhetorical debate, weigh alternatives and case construction.

It can be seen from the impact which modern cognitive psychology exerts on modern teaching, especially on the role conversion of teachers and learning process of students, the progress of critical thinking teaching count on the general principle of modern cognitive psychology to a large extent. Critical thinking teaching uses thinking patterns that adults generally use and we know about, and the effective method to actively change "default thinking pattern". The outward changes have caused some changes, such as new demands and challenges of technology; the other past successful changes have indicated that critical thinking teaching could help college students think better. It is always difficult to predict the future, but it will always be a critical component of college courses. Nowadays, demands for work place become more and more complex, and higher education is more important than ever. As long as critical thinking is the result that education expects, then some methods need to be found to help students to elevate their ability of critical thinking and the temperament to use these skills.

2. THE INSPIRATION THAT CRITICAL THINKING TEACHING IN NORTH AMERICA BRINGS TO THAT IN CHINA

Any advice from others may help our defects. There are four inspirations that the features of critical thinking taught in North America bring to the commencement of critical thinking teaching in China.

First of all, only when our education departments, government and the whole society truly realize the significant role and meaning of critical thinking skills and temperament as modern social citizens' basic quality, can the critical thinking teaching concept take root in our education, and flourish long-lastingly in practice. As a result, we shall free our mind and exert a great discussion about critical thinking in the educational circles even in the whole society, in order to unify the understanding.

Secondly, cultivate a troop of teaching staff with critical thinking skills and temperament based on different disciplines and courses.

Thirdly, commence critical thinking teaching with plans and steps based on national conditions. Especially, implement the cultivation and elevation of students' critical thinking skills and temperament in teaching practices in different disciplines and courses.

Last but not the least, deepen the research of critical thinking teaching, and especially take how to elevate students' skills and temperament as an important subject, in order to produce a bunch of high quality research results to guide the critical thinking teaching in China.

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